BIOL 501 –Advanced Plant Physiology-Online
Western Kentucky University
Syllabus and Course Information Sheet

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Class Schedule:
Lectures: Video Lectures posted weekly on Blackboard Course Site

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WELCOME TO BIOL 501

Congratulations to you all for joining the Western Kentucky University academic family and a warm welcome to our Plant Biology community. Did you know that PLANTS benefit our lives not just as food sources, but they have life of their own? Did you know that plants have physiological and mechanistic processes to sense the outside world? Is there a clear scientific explanation for how a Venus flytrap catches insects? Can a plant direct pollination by sensing and controlling an insect's movements? Can plants direct flowers to bloom in spring? Can plants sense the weather patterns? And do they respond to Led Zeppelin or Mozart or Bach?

This course will be the answer to all your questions and will lay a strong foundation of the basic concepts of molecular plant physiology and plant environmental signaling.

As in my earlier classes I will adopt the teaching methodology of "deep learning," a process where the student learns with understanding as opposed to rote or surface learning where he/she just collects innumerable unrelated facts. I excitedly look forward to introducing you to the WORLD OF PLANTS interspersed with episodic historical anecdotes, real world examples and modular schematic visuals towards a greater understanding of WHAT WE OWE TO PLANTS in terms of bettering our lives. The rest of the course information sheet will help you to understand the objectives we will achieve through this course, the methods used to measure and gauge your progress throughout the course, and the WKU academic policies and rules.

COURSE DESCRIPTION

Biology 501 (Advanced Plant Physiology-online) is a course that illustrates the current advances in plant physiology and their potential application in understanding the molecular basis of plant physiological processes. The course consists of online interactive lectures that involve written analysis of real-world case studies of all concepts discussed as well as virtual online lab sessions specific to looking at model plants to understand molecular plant physiology

STUDENT LEARNING OUTCOMES

After successfully completing Biol 501, the student will have a theoretical and working knowledge of:

1. The molecular mechanisms involved in plant physiology and plant interaction with environment
2. The basic and advanced concepts of plant physiology, plant molecular interactions and plant environmental signaling including mechanisms for plant disease resistance, plant nutritional quality, plant pharmacology, molecular basis for processes such as biotic and abiotic stress tolerance
3. The basic lab techniques involved in molecular plant physiology such as plant DNA/RNA molecular elements, plant tissue interactions with environment and model plants involved in plant physiology research.
4. Specific case studies involving significant milestones in molecular plant physiology through written reading reactions aimed at a literature review publication.

EXPANDED COURSE DESCRIPTION

Please refer to the lecture schedule at the end of this document

STUDY MATERIALS

Study materials in the form of power point slides and journal articles will be provided by me and will be posted on the blackboard course site.

CLASS POLICIES

Attendance: WKU believes that regular class attendance is a crucial component for student success. Every class lecture is a vital foundation for subsequent class meetings. Without full participation and regular class attendance, students will be at a severe disadvantage for achieving success at college. Class participation (including exams and assignments) is vital to understand the subject matter in a thorough manner. It is my responsibility as a faculty member, to determine how participation is achieved in all my classes. I will require students to regularly view the posted lectures on blackboard and the record of attendance as determined by participation in online discussion forums will be recorded from the first day of class and/or the first day the student's name appears on the roster through final examinations. When a student has a prolonged absence measuring to a week, as seen as inactivity on discussion forums, the student will receive an emailed warning from me that upon one more day of unexcused absence, the student will be dropped from all classes in which the unexcused absences are reported. Some of the forms of absence that can be considered officially excused are: (1) Sick and medical emergencies (2) Representing WKU/parent institution at an official institutional function. Other excuses will be considered, at my discretion, with documentation.

Dropping: If a student chooses to drop the course, it is that student's responsibility to ensure proper documentation with WKU. Failure to do so could result in a grade of F in the course. If you wish to withdraw from the course you should do so by the dates mandated by the University. Be sure you are aware of these dates because credit for the course will not be changed after the university's designated time. You also cannot drop the class or Withdraw after the designated time.

Disabilities: "Students with disabilities who require accommodations (academic adjustments and/or auxiliary aids or services) for this course must contact the Office for Student Disability Services at (270) 745-5004. Please DO NOT request accommodations directly from the professor or instructor without a letter of accommodation from the Office for Student Disability Services."

Dishonesty Statement: WKU does not tolerate cheating, plagiarism or other acts of dishonesty. Definitions of these acts and procedures for dealing with them are described in the WKU standards of professional conduct on the university website and in the student handbook.

Civility Statement: Members of the WKU community, which includes faculty, staff and students, are expected to act responsibly in the online classroom. WKU holds all members accountable for their actions and words. Therefore, all members should commit themselves to behave in a manner befitting a responsible College and Civilian community. Responsible College and Civil behavior applies to the language and behavior as exhibited by online postings. Please refrain from offensive online postings during discussions in the academic classroom and lab sessions.

COURSE REQUIREMENTS AND CRITERIA FOR GRADING

Lecture Exams: There will be three lecture exams during the semester. Exams will be of multiple choice or short answer questions based on case studies to examine your grasp on knowledge learned in class. Make-up exams are only offered to students with an excused absence. Excused absences include those officially recognized by WKU. To arrange for a make-up exam please e-mail me during the first class period following your absence. **An unexcused absence from an exam will result in a grade of zero.**

Literature review manuscript: Specific case studies covered in class will be the foundation for the students to submit a literature review manuscript modeled in the journal *Trends in Plant Sciences* format.

Assignments: Periodic assignments will cover recent topics and assigned readings from the lectures.

Research manuscript: A manuscript that encompasses all the facets of reporting a transgenic plant research study modelled on the format of the journal *Plant Physiology*.

Final Project: The final project will be a presentation of a case study, an experimental plan or a literature review which you will design and execute as your choice while traversing the lecture and lab sessions. On the day of the final, you will do a virtual classroom presentation of your work

Point Distribution:	Lecture Exams (3 exams x 100 points each)	300 points
	Literature review manuscript	100 points
	Final Project	100 points
	Research manuscript	100 points
	Assignments	100 points
		700 points

LECTURE SCHEDULE

Day 1 INTRODUCTION-What's in it for me?

Module 1 (Weeks 1-3) **What a Plant sees?**

- The legacy of Charles Darwin as a botanist
- Model Plant – Maryland mammoth – The ever-growing tobacco
- Day-night sensing by plants

Exam 1

Module 2 (Weeks 4-6) **What a Plant smells?**

- Do plants "find" food?
- Why do leaves fall in autumn?
- Sensing molecules and processes in plants

Exam 2
Literature Review Manuscript

Module 3 (Weeks 7-9) **What a Plant feels?**

- The legacy of Jagadish Chandra Bose – The first biophysicist
- Model Plant – Venus Flytrap
- A comparison of plant and human feelings

Exam 3

Module 4 (Weeks 10-12) **What a Plant hears and knows?**

- The plant "hearing" genes
- The plant movement hormones
- "Dancing plants?"
- The molecular balance of plant physiology

Research project and manuscript basics

Module 5 (Weeks 13-15) **What a Plant remembers?**

- The short-term and long-term memory in plants
- Model Plants – Bamboo and Venus Flytrap
- The "Aware Plant"

Research Manuscript
Final Project Presentation – Virtual Seminar